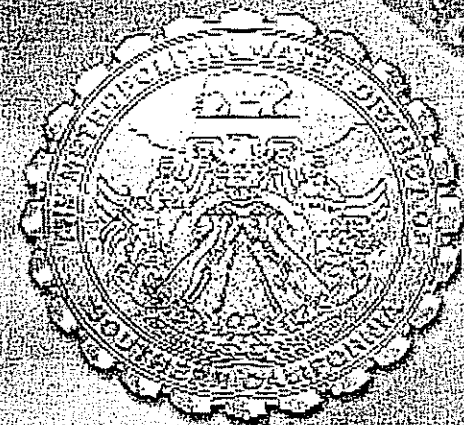


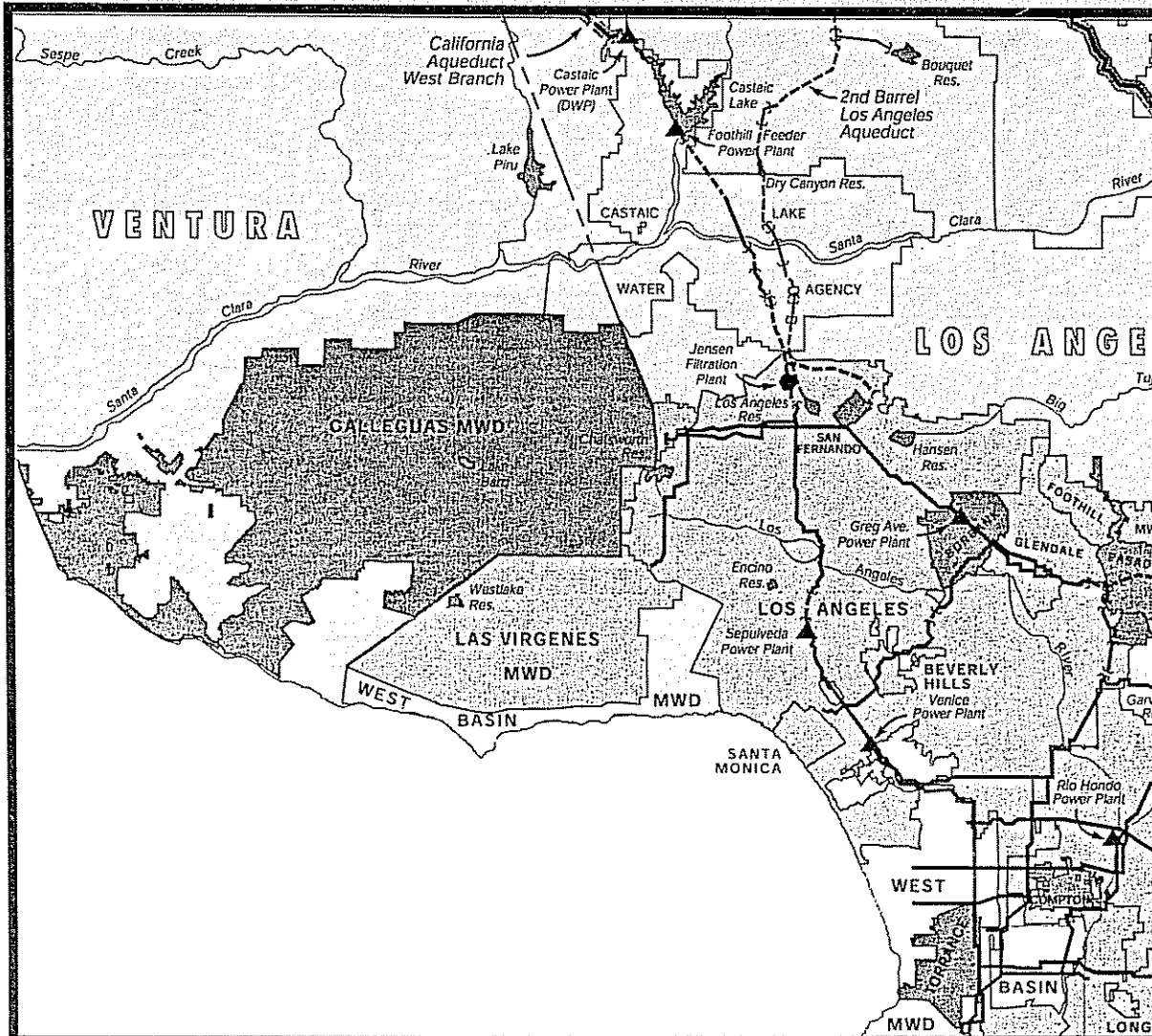
2-2

# **ADAPTABILITY:** Achievements in Conservation, Recycling and Groundwater Recharge



Metropolitan Water District of  
Southern California  
[www.mwdh2o.com](http://www.mwdh2o.com)

# Metropolitan's Service Area



## About Metropolitan

Metropolitan Water District of Southern California is a public agency established in 1928 by the state Legislature to secure imported water supplies and to educate residents on water-related issues. Metropolitan is governed by a 37-member board of directors, representing 26 member public agencies that serve 18 million people living in six counties stretching from Ventura to San Diego.

As the region's water wholesaler, Metropolitan draws supplies through the Colorado River Aqueduct, which Metropolitan owns and operates, and from Northern California via the State Water Project. Metropolitan also is engaged in long-term water use efficiency and water management programs that are further described in this report.

*The mission of Metropolitan is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.*



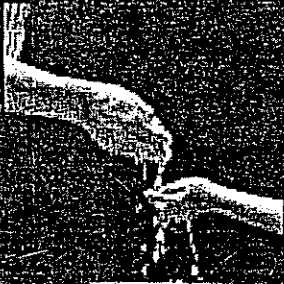
# Table of Contents

For more information about this report, contact Kathy Cole, Metropolitan's legislative representative at (916) 650-2642 or [kcole@mwdh2o.com](mailto:kcole@mwdh2o.com)

The flowers pictured throughout this report are native to California and found in many Southern California locales. They give a taste of the variety and beauty available through the use of native plants. Their pictures came from the *California Web site* — [www.calflora.org](http://www.calflora.org). This organization provides information on California plants for conservation, research and education and participates in the University of California at Berkeley Digital Library Research Project. A resource guide for more native plant information is contained in the Appendix.

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# Executive Summary



Ensuring reliability from generation to generation



Desert Four O'clock  
(*Mirabilis multiflora* var.  
*pubescens*)  
© 1998 Charles Webber  
California Academy of Sciences

Metropolitan Water District of Southern California is proud to submit the third annual progress report to the state Legislature on water resource management programs to spotlight new achievements in water conservation, recycling and groundwater recharge. This annual report is a requirement of the 1999 amendment to the Metropolitan Water District Act (SB 60) and provides an opportunity to reflect and document progress from year to year.

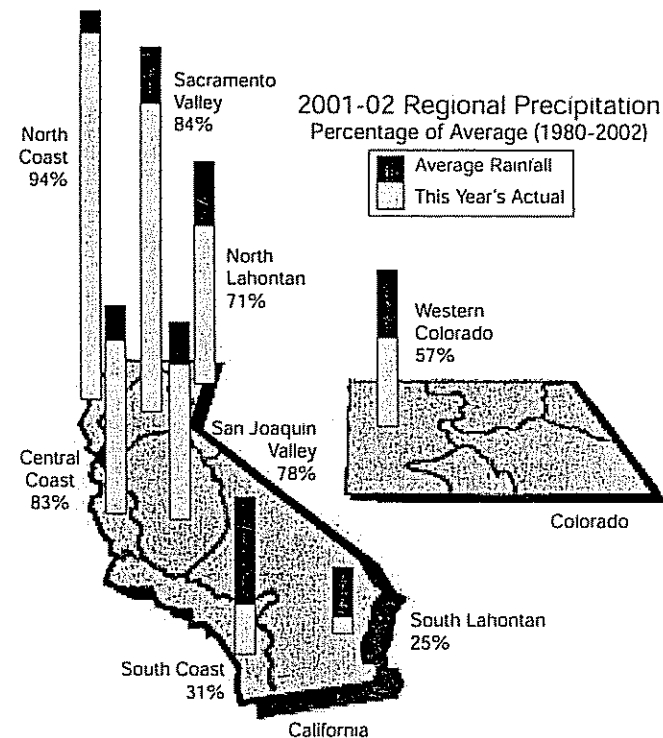
In 2002, we found ourselves with headline-making weather as hot temperatures and little rain caused drought conditions in nearly half of the 48 contiguous states. Many parts of the Southland, including San Diego and Los Angeles, endured the driest rainfall season in more than 100 years. Nonetheless, the Los Angeles Times declared the Southland to be "Faring Well in Dry Spell" (Sept. 22, 2002).

Why was Southern California able to withstand this drought better than other areas in the West? The region's good fortune is credited to Metropolitan's integrated resources planning effort that has created a diverse resource portfolio, complemented by an aggressive conservation program.

Reassurances of reliability were not as resounding in the rest of the country. Many states found themselves with counties declared federal disaster areas because of the effects of drought. By contrast, Southern California expects to have a reliable water supply for the foreseeable future. As a prudent utility manager, Metropolitan has developed redundancy to protect the reliability of its entire water system. Two years ago, Metropolitan began aggressively preparing for the possibility that the Colorado River surplus supply could be curtailed, either by drought or the failure of the Quantification Settlement Agreement (QSA)

regarding the use of Colorado River water in California. Metropolitan has maximized storage options and today has over two million acre-feet of water in storage.

The Colorado River Aqueduct and State Water Project provide a foundation for Metropolitan's water reliability. A cornerstone is built on ultra-low-flush toilets, water-efficient showerheads and appliances and other conservation measures, legions of water recycling projects and numerous agreements to transfer and store surplus water. The benefits from more than a decade of drought-proofing are paying off. And at just the right time.



# Executive Summary

California faces a reduction of about 15 percent of its draw of Colorado River water. Metropolitan, having a lower priority right to the Colorado River in California, would bear the major portion of this reduction. Pursuant to the 1964 U.S. Supreme Court Decree in *Arizona v California* and the Boulder Canyon Project Act, California must live within its 4.4 million acre-feet basic annual apportionment of Colorado River water in the absence of surplus Colorado River water and unused Colorado River water apportionments of Arizona and Nevada.

If an agreement is reached on how California is to reduce its use of Colorado River water that is acceptable to the U.S. Department of the Interior and the other Colorado River basin states, California will be allowed a weaning period along with a "soft landing" that includes continued access to surplus water, as available, by Metropolitan for the next 15 years. The amount of surplus water that will be available is uncertain because of continuing drought conditions in the Colorado River basin.

A framework for the QSA moved forward in late October with approvals from the respective water boards required by year's end. The Agreement was not reached and California's access to surplus water has been suspended until such time as either the Agreement is executed or such other actions as are required by the Secretary of the Interior are completed. Failure to reach this milestone means that Southern California will have to expedite longer-term plans to meet reliability needs.

Metropolitan's strategy of managing demand has created a diversified water resource portfolio. Many of these programs will be discussed in greater detail in this report. The latest entry in the expanding resource portfolio is Metropolitan's outdoor conservation campaign. Launched in summer 2002, the cam-

paign is designed with two objectives: to encourage more efficient outdoor irrigation schedules and, at the same time, to promote appreciation and use of native and drought-proof plants by reintroducing an exciting Southern California style of landscaping. This program marks an expansion of Metropolitan's successful indoor conservation program to outdoor conservation in order to tap into an area with great potential for savings. Between 30 to 70 percent of residential water consumed in Metropolitan's service area goes outside to water the landscape.

The theme of recapturing California's natural landscape heritage by returning to the use of native and drought tolerant plants has positive implications for water supply managers. Adapting to our natural surroundings—a semi-arid region—has produced some of the most successful water management programs.

Last year, Metropolitan's first Innovative Conservation Program (ICP) was completed, providing more than \$200,000 for 10 promising conservation ideas. As a result of the program, two new conservation tools—a recirculating X-ray film developer and a pressurized water broom—were adopted within Metropolitan's rebate program. A second ICP is planned for 2003. Metropolitan's board has also approved additional rebates for dual-flush toilets and rebates for evapotranspiration (ET) landscape irrigation controllers, and has approved a hotel/motel/restaurant customer water conservation education card program.

Turning ocean water into drinking water became more viable with the introduction of Metropolitan's Seawater Desalination Program. Launched in the summer of 2001, the program objective is to provide financial and technical support for the development of cost-effective seawater desalination projects.



Metropolitan launched an online index to guide outdoor landscape irrigation —  
[www.mwdh2o.com](http://www.mwdh2o.com)

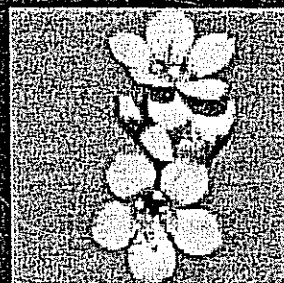


Chuparosa  
(*Justicia californica*)  
© 2002 Glenn Vargas  
California Academy of Sciences

# Executive Summary



*Funding partnerships extend Metropolitan's resources into the community*



*Chaparral Gilia  
(Gilia angulensis)*  
© 2000 Wayne D. Johnson

A call for proposals produced five projects by member agencies which show promise and were evaluated by Metropolitan's review committee. Collectively, the projects could produce about 126,000 acre-feet of drinking water per year. The program is in its early stages and the qualifying projects are subject to approval by Metropolitan's board.

Extending the usefulness of existing supplies is the purpose of Metropolitan's water recycling program that, to date, has awarded approximately \$95 million in performance-based grants. In fiscal year 2002, Metropolitan-supported programs, along with member agency projects independent of Metropolitan funding, produced about 201,000 acre-feet of recycled water. To put this amount into perspective, it is equal to roughly one-third of the water used annually in the city of Los Angeles.

In 2002, Metropolitan entered into two groundwater agreements that allow for the storage of 16,000 acre-feet of imported surplus water for future use. Metropolitan also is finalizing five more programs that collectively will increase groundwater storage capability by 192,000 acre-feet.

A common theme throughout all of Metropolitan's projects is partnerships that underline Metropolitan's commitment to outside public involvement. Throughout the course of these partnerships, all of the agencies and organizations are interdependent, drawing on each other's expertise and resources.

Metropolitan's Community Partnering Program—which continued in its third year to provide grants for conservation-themed projects—awarded \$550,000 for 74 projects that range from a children's water festival to a habitat restoration study at a former duck farm along the San Gabriel River.

Partnering opportunities extend beyond Southern California boundaries with investments in Northern California projects. In 2002 Metropolitan gave a \$10,000 grant to the Sacramento River Watershed Program to help, through public education, in the preservation of one of the nation's largest and most critical watersheds. This money is in addition to the \$30 million Metropolitan invested in projects aimed at improving environmental conditions in the San Francisco-San Joaquin Bay-Delta watershed. The Bay-Delta is critical to California's economy and provides drinking water for two-thirds of the state.

All of these projects amount to seeds for savings and reliability. Metropolitan has long realized the value of planning today for tomorrow's benefit.

## Average Per Capita Water Use (gallons per capita per day)

Seattle	103
San Francisco	106
Tucson	135
El Paso	136
Portland	137
<b>Los Angeles</b>	<b>140</b>
<b>San Diego</b>	<b>150</b>
Santa Cruz	155
Boulder	157
Missoula	158
Oakland	160
Albuquerque	182
Phoenix	184
Denver	228
Salt Lake City	284
Las Vegas	307

Source: American Water Works Association



# Executive Summary

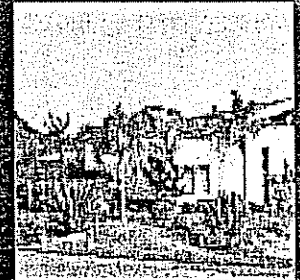
Metropolitan-Assisted Local Resources Cumulative Investment Through Fiscal 2002		To Produce	Fiscal 2002 Production
Active Conservation <sup>1</sup>	\$171 million		68,000 AFY
Water Recycling	\$95 million		75,000 AFY
Groundwater Recovery	\$26 million		32,000 AFY
Metropolitan-Assisted Groundwater Programs Cumulative Investment Through 2002		To Store	Dec. 2002 Storage
Contractual Storage <sup>2</sup>	\$28 million		245,800 AF
Water Rate Incentives <sup>3</sup>	\$282 million		

<sup>1</sup> "Active conservation" is water saved directly as a result of conservation programs by water agencies. In contrast, "passive conservation" is water saved as a result of changes in efficiency requirements for plumbing fixtures in plumbing codes.

<sup>2</sup> Contractual storage investments are Metropolitan funding of the Metropolitan-Calleguas Municipal Water District Groundwater Storage Conjunctive Use Program in the North Las Posas groundwater basin.

<sup>3</sup> "Water rate incentives" represent the discount in water rates Metropolitan provides to its member agencies to encourage groundwater storage. The calculation methodology for water rate incentives has been updated and refined for this report. Prior year calculations for cumulative water rate incentives are revised as follows: through 2000 = \$237 million; through 2001 = \$264 million.

AFY = acre-feet per year. An acre-foot is equal to 325,851 gallons, or enough water to supply the needs of two typical Southland families in and outside their homes for one year.



*Landscaping using California native plants adds color and a sense of history*



*California Sycamore  
(Platanus racemosa)  
© 1998 Charles Webber  
California Academy of Sciences*



# Timeline of Achievements



## Prior to 1960

Incentives first provided for delivery of wet year supplies to encourage groundwater recharge

## 1974

Colorado River Basin Salinity Control Act

## 1976-1977

Metropolitan initiates several conservation incentive programs

## 1981

Implemented Interruptible Program, providing a reduced price incentive to encourage storage of surplus water

## 1982

Launched Local Projects Program

## 1985

Adopted first Regional Urban Water Management Plan (RUWMP — This is updated every five years)

## 1988

Launched Toilet Retrofit Program

Launched Conservation Credits Program

## 1989

Implemented Seasonal Storage Program

## 1990

Adopted RUWMP update

## 1991

Launched Groundwater Recovery Program  
Signed MOU establishing Conservation Best Management Practices

## 1990 - 1993

Imperial Irrigation District/Metropolitan water conservation program

Widespread implementation of the Toilet and Showerhead Retrofit Program

Initiated test program for water transfers between Metropolitan and Palo Verde Irrigation District

Metropolitan/Central Arizona Water Conservation District Groundwater Demonstration Program

## 1995

Adopted RUWMP update

Signed Las Posas Groundwater Storage Agreement

## 1996

Adopted Metropolitan's Integrated Resources Plan (IRP)

## 1998

Metropolitan staff appointed to serve as Watershed Council board liaison

Established new Local Resources Program for development of recycled water & recovered groundwater

Imperial Irrigation District (IID)/San Diego County Water Authority (SDCWA) water transfer agreement

Metropolitan/SDCWA exchange agreement re: IID/SDCWA Transfer

## 1999

Adopted Water Surplus and Drought Management Plan

SB 60 signed into law

Formed Salinity Management Coalition & hosted Salinity Summit I

Adopted Strategic Plan Policy Principles

Created Community Partnering Program

Final rule Colorado River offstream storage

Metropolitan adopted long-term Salinity Management Plan

Executed key terms for a Quantification Settlement Agreement

# Timeline of Achievements



## 2000

- Adopted RUWMP update
- Hosted Watersheds Dialogue conference
- On-going participation in Water Augmentation Study by L.A. & San Gabriel Rivers Watershed Council
- Hosted Climate Change workshop
- Received recognition from the National Drought Policy Commission
- Launched the Innovative Conservation Program
- Developed California's Draft Colorado River Water Use Plan

## 2001

- First annual report to the Legislature on achievements in conservation, recycling & groundwater recharge
- Salinity Summit II
- Adopted new rate structure plan
- Launched CII Region-wide Program
- Initiated IRP update
- SB 221 & SB 610 signed into law - linking development to supply reliability
- Colorado River Record of Decision on Interim Surplus Guidelines

## 2001

- Metropolitan/Arizona Interim Surplus Guidelines Agreement
- Metropolitan/PVID Principles for Land Mgmt., Crop Rotation, and Water Supply
- Metropolitan Land Purchase in Palo Verde Valley
- Metropolitan approved funding for conservation/mitigation measures for Colorado River Transfers
- Launched Community Partnering Program
- Turned over Bolsa Chica property to state for wetlands and watershed protection

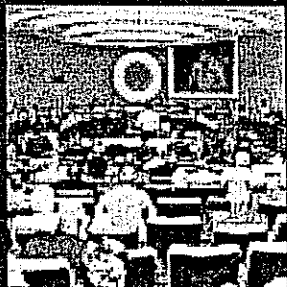
## 2002

- Rebate provided for two millionth ULF toilet retrofit
- Launched native plant and outdoor sprinkler index conservation outreach program
- Metropolitan/Southern Nevada Water Authority Surplus Guidelines Agreement
- Initiated efforts to secure 200,000 AF of 2003 transfer supplies from north of the Delta

## 2002

- Initiated efforts to secure 2004 transfer supplies from the San Joaquin Valley
- Completed agreements and environmental review for Kern Delta Water District Water Management Program
- Completed first Innovative Conservation Program and initiated second program for 2003
- Metropolitan issued "Report on Metropolitan Water Supplies" forecasting 20 years of reliability
- Expanded activity in all phases of conservation rebate program
- Began development of Water Education Center at Diamond Valley Lake
- Adopted board principles on climate change
- Began final negotiations with Sacramento Valley interests for 185,000 AF annually to contribute to Bay-Delta environmental needs and standards
- Continued IRP update
- Board approval of PVID Land Management, Crop Rotation, and Water Supply Program

# Conservation



*Metropolitan's 37-member board of directors operates in a public arena*



*Montia-Like Monkeyflower (Mimulus montioides)*  
© 2001 Steve Schoenig

## Guiding Policies

Metropolitan is committed to providing high-quality water conservation programs and services. Since 1992, Metropolitan and its member agencies have invested more than \$252 million in conservation programs within the region. Metropolitan's contribution alone is \$171 million. The commitment to conservation continues to expand while the focus of programs has shifted to capture new innovative opportunities for savings.

Metropolitan's conservation policies have their foundation in two documents—Metropolitan's Integrated Resources Plan (IRP) and the Memorandum of Understanding Regarding Urban Water Conservation in California, to which Metropolitan is a signatory.

Metropolitan's leadership and support of conservation extends to the greater water community in California. It reaches into the legislative arena as well, where Metropolitan has been instrumental in supporting new policies that support conservation projects and programs. Metropolitan has been recognized for its efforts in the form of the "Gold Star" certification from the Association of California Water Agencies and several awards from the U.S. Bureau of Reclamation.

Metropolitan's adoption of a new rate structure includes a funding source dedicated to conservation, recycling, groundwater recovery and other local projects. The new rate structure became effective January 1, 2003 and includes two tiers that use price signals to encourage water agencies to invest in cost-effective conservation, water recycling, transfers, desalination and groundwater programs.

In addition, the two-tiered structure allocates a greater share of costs to Metropolitan's member public agencies that use more water in the future.

This new structure represents a departure from the previous structure in many ways, most notably in a pricing plan that gives member agencies more flexibility and choice in how they obtain water, while implementing an inclining block rate. The "Water Stewardship Rate" initially funds Metropolitan's Local Resources and Conservation Credits Programs and provides financial support to member agencies for furthering local water management programs.

## The Conservation Credits Program

The backbone of Metropolitan's conservation program is the Conservation Credits Program initiated in 1988. Metropolitan contributes either one-half the program cost, or \$154 per acre-foot of water conserved, whichever is less, to assist member agencies in exploring new program opportunities.



# Conservation

## Partnering with Agriculture

Parallel to its urban water conservation efforts, Metropolitan began a pioneering agricultural water savings program in 1990 with the Imperial Irrigation District (IID). To date, Metropolitan has invested more than \$180 million to construct, operate and maintain these projects which will conserve more than 100,000 acre-feet of agricultural water every year for a minimum of 35 years (commencing in 1998). Calendar year 2002 water savings were 104,940 acre-feet.

Metropolitan entered into an exchange agreement with the San Diego County Water Authority (SDCWA) in 1998 to facilitate the transfer of up to 200,000 acre-feet of conserved agricultural water annually to urban Southern California if and when the Quantification Settlement Agreement (QSA) is executed. Under this agreement, SDCWA will receive from Metropolitan an amount of water equal to the amount of water conserved by IID under the 1998 SDCWA-IID Agreement for Transfer of Conserved Water.

## Palo Verde Irrigation District Land Management, Crop Rotation and Water Supply Program

From 1992 to 1994, Metropolitan conducted a test program involving farmers in the Palo Verde Valley served by the Palo Verde Irrigation District (PVID). Participants agreed to set aside a portion of their land, on a rotating basis, and save the water normally used for irrigation in exchange for payment by Metropolitan.

The program saved about 186,000 acre-feet of water from roughly 20,000 acres of farmland that were not irrigated. It is important to note that under this program no farm land is being "retired," and there is no conversion of agricultural land, nor loss of prime agricultural land.

With the success of the pilot program, Metropolitan's board authorized \$94.3 million in October 2002 to initiate a full-scale 35-year land management, crop rotation and water supply program. At Metropolitan's request, farmers would stop irrigating between 7 to 29 percent of their land, on a rotating basis, securing about 8 to 36 billion gallons of water each year for Southern California. Farmers would receive a one-time payment of \$3,170 per acre for each farmer's maximum non-irrigated acreage and an additional payment of \$550, subject to escalation, for each acre not irrigated under the program in a given year.

As part of the agreement, Metropolitan would account for any potential negative economic impacts on the Palo Verde community by funding an estimated \$6 million for local community improvement programs. The funds would be administered by a non-profit foundation selected by Palo Verde Valley community representatives.

The QSA provides for the program water to flow to Metropolitan. Absent the QSA, the program could require the concurrence of the Imperial Irrigation District and the Coachella Valley Water District, or the program could be implemented through other means.

## Numbers

**33.2-miles** – Length of the Coachella Canal Lining Project

**26,000** – Number of acre-feet that would be available by lining the Coachella Canal

**23 miles** – Length of the All American Canal Lining Project

**67,700** – Number of acre-feet of water per year to be saved by lining the All American Canal

**16,000** – Number of acre-feet allocated to the San Luis Rey Indian Water Rights Settlement Parties

**\$180 million** – Investment made by Metropolitan to construct, operate and maintain conservation projects in cooperation with Imperial Irrigation District to date

**104,940** – Acre-feet of agricultural water conserved in 2002

**35 years** – Term of agreement with Palo Verde Irrigation District approved by board to transfer water saved by removing portions of land from irrigation

# Conservation

## Coachella and All American Canal Lining Projects

The Secretary of the Interior is authorized to concrete line portions of the existing earthen All American and Coachella Canals. The conserved waters would become part of the water supply for Metropolitan's Colorado River Aqueduct.

### *Coachella Canal Lining Project*

Metropolitan has an agreement with the California Department of Water Resources (DWR) to fund the Coachella Canal Lining Project. Under the agreement, DWR will reimburse Metropolitan for up to \$74 million in environmental compliance, design, and construction costs for the project. Once complete, the 33.2-mile Coachella Canal Lining Project will conserve 26,000 acre-feet of water per year that would otherwise be lost to seepage and that will be available for transfer.

In March and April 2002, the necessary approvals were received from the U.S. Bureau of Reclamation and California Department of Fish and Game to begin the project. In April 2002, Coachella Valley Water District selected a design firm. Construction begins in 2003.

### *All American Canal Lining Project*

Imperial Irrigation District has executed a funding agreement with DWR for the All American Canal Lining Project. Metropolitan will provide an advance of \$450,000 to begin preliminary environmental and engineering work. These advanced costs will be reimbursed by DWR upon release of state funds. The 23-mile project will conserve 67,700 acre-feet of water each year that will be available for transfer.

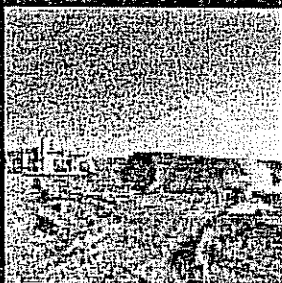
Water made available through both projects will not only enhance Metropolitan's supply reliability, but will provide the water needed to settle a long-standing water dispute among the La Jolla, Pala, Pauma, Rincon and San Pasqual Bands of Mission Indians and the city of Escondido and Vista Irrigation District. Metropolitan has agreed to exchange water earmarked for the settlement parties.

## CALFED Funded Grants in 2002

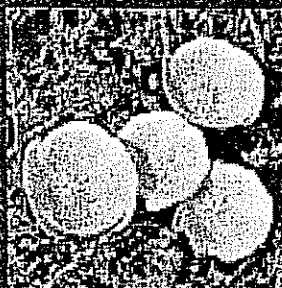
- Residential Washer Rebate Program - \$925,000. This grant energized the market for high-efficiency clothes washers. Because of the program's popularity, grant funding was fully committed by November 2002.
- Bilingual Landscape Course Development - \$100,000. This grant allows for the development of Protector del Agua course materials that teach water conservation techniques related to plants and irrigation to both professional and non-professional landscapers.

## California Public Utilities Commission Grants

The CPUC made first-time grants available for energy conservation programs that in years past had been earmarked only for investor-owned utilities. Metropolitan, in partnership with the California Urban Water Conservation Council and other water agencies, was awarded \$2.2 million for the installation of water-saving devices in small restaurants. Metropolitan and its member agencies will receive almost 75 percent of the funding, or \$1.6 million, for the installation of 12,000 pre-rinse spray heads that save water and energy.



*Coachella Canal Lining Project*



*California Poppy  
(Eschscholzia californica)  
© 1995 Br. Alfred Brouseau,  
Saint Mary's College*

# Conservation

## Technical Workshops

Metropolitan hosted several technical workshops for member agency conservation coordinators to provide updates on conservation devices, test and research projects, and program approaches.

## Hardware Retrofits and Other Services

- Retrofitted approximately 200,000 ultra-low-flush toilets (ULFT), bringing the total to over 2 million retrofits to date, saving roughly 23 billion gallons per year.
- Provided rebates for 13,000 high-efficiency clothes washers, bringing the total to over 30,000. High-efficiency washers save 90,000 gallons over their lifetime.
- Conducted 6,500 on-site surveys of outdoor/interior water use, identifying opportunities for water savings.

## Extension of the Commercial, Industrial and Institutional Program

In May, Metropolitan's board authorized a time extension and a funding increase for the Commercial, Industrial and Institutional (CII) rebate program to fund the purchase of non-residential water conserving hardware, including ULFTs, urinals, water-efficient clothes washers and cooling tower retrofits. In August, the board also approved adding two new devices, developed under the Innovative Conservation Program, to the list of fixtures eligible for CII rebates. The new rebates are \$2,000 for an X-ray developer recirculating device in hospitals and \$100 for a pressurized water broom.

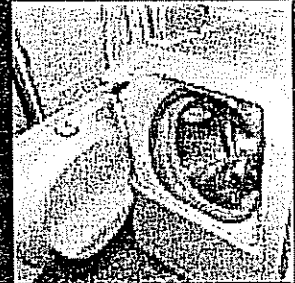
## Innovative Conservation Program (ICP)

The first year of the ICP was completed in 2002 and provided a roster of new technologies, along with a better understanding of the market for conservation devices and promotional opportunities for new and existing programs. Other new concepts in water conservation were showcased and remain the subject of further refinement. In August 2002, Metropolitan's board authorized a second ICP for 2003. The application is available at [www.mwdh2o.com](http://www.mwdh2o.com).

## New Programs

In August 2002, Metropolitan's board approved three new conservation program elements:

- Hotel/motel/restaurant customer education to provide free cards to businesses encouraging their guests to reuse bed linens and towels to save water. There will also be free "table-tent" cards for restaurants informing customers that water will only be served on request.
- Dual-flush toilets have been shown to save more water than standard ULFTs and are now given an additional \$20 rebate on top of the existing \$60 ULFT rebate. Dual-flush toilets operate at 1.6 gallons per flush for solids and 0.8 gallons per flush for liquids.
- Evapotranspiration (ET) irrigation controllers are now eligible for a \$65 rebate per unit.



*High-efficiency clothes washer*

## Numbers

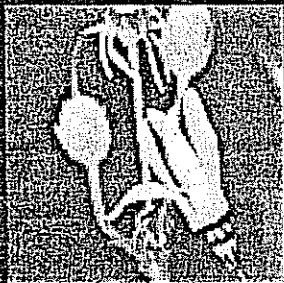
*Two million – ULF toilet retrofits*  
*23 billion gallons – Water saved by 2 million ULFTs each year*  
*30,000 – High-efficiency clothes washers credited to the rebate program*  
*6,500 – On-site surveys of interior/exterior water use this year*  
*\$1.6 million – Funds received by Metropolitan from the California Public Utilities Commission for hardware retrofits in small restaurants*  
*336 – Residential and professional landscape classes in water-wise landscaping*



# Conservation



*Water education programs provide hands-on learning experiences for school children*



*Cleveland's Shooting Star  
(Dodecatheon clevelandii sp.  
clevelandii)  
© 2000 Wayne D. Johnson*

## Education

During 2002, Metropolitan, in conjunction with its member agencies, made its education materials, activities and events available to more than 230,000 K-12 students and 1,300 teachers throughout the service area. Key programs included All About Water (grades K-3), Admiral Splash (grade 4), Water Ways (grade 5), Water Quality (grades 7-12), Water Politics (grades 9-12) and Water Works (grades 6-12).

Just over 3,000 grade 4-12 students participated in field trip programs at Metropolitan water treatment plants. Each experience featured a hands-on, assemble-and-take-down Source, Treatment and Distribution Model that allows students to become engineers and water planners at the same time.

In 2002, Metropolitan's Diamond Valley Lake Sixth-Grade Education Program welcomed more than 3,500 students. The program features interactive activities focusing on the biology, chemistry, geography/geology, environmental, and conservation issues involving the Southland's largest reservoir.

Metropolitan also launched a highly acclaimed program called, "Liquid Art" to inform adults about the history of water in Southern California as it is reflected in public art. Six gallery "shows" opened throughout the region and earned the cover story for Westways Magazine and the PBS program "Road Trip with Huell Howser." The media exposure and exhibits reached millions throughout the region.

## Memberships

Metropolitan continues to support water industry organizations with both financial contributions and staff participation. Metropolitan staff serve on the California Urban Water

Conservation Council (CUWCC), CALFED subcommittees, California Water Awareness Campaign, the Southern California Water Dialogue, the Advisory Committee for the University of California's Center for Water Resources and the American Society of Mechanical Engineers/American National Standards Institute for plumbing fixture standards.

Metropolitan also has been involved in several nationwide studies that evaluate plumbing fixtures and new technology potential, and contributes annually to the American Water Works Research Foundation, as well as providing 50 percent of the CUWCC dues for its member agencies.

## Research and Support

- Completed the Orange County Saturation Survey estimating the number and distribution of water-efficient fixtures in residential settings
- Reviewed available research on added water savings from dual-flush toilets and increased Metropolitan's rebate for dual-flush toilets by \$20
- Initiated a bench test of three competing "ET" (evapotranspiration) -style irrigation controllers
- Maintained nine California Irrigation Management Information Systems (CIMIS) stations in support of several landscape programs
- Provided the services of two consultants to assist member agencies in tracking data from their centralized irrigation controller system retrofit projects

# Conservation

## Protector del Agua (PDA) Training

The PDA series of courses is being revamped for an early 2003 launch to include more emphasis on the use of native and drought tolerant plants in residential gardens and to support Metropolitan's new focus on outdoor irrigation efficiency. Professional landscape participants numbered 2,246 in 2002 and residential participants numbered 3,608. The total number of PDA participants through calendar year 2002 was 19,300.

The PDA residential course is four hours and covers the basics of irrigation systems, watering and fertilizing, landscape design and plant identification. The course offers hands-on exercises and demonstration displays to provide an interactive learning experience and a clearer understanding of irrigation hardware and the plant-water-soil relationship.

The PDA professional course is directed toward landscape maintenance personnel and is taught in both English and Spanish. It consists of six four-hour classes in landscape management and covers basic irrigation principles and irrigation scheduling.

A new six-hour PDA class for professionals provides education in plant identification, characteristics and water use requirements for common landscape plant species. It is also taught in both English and Spanish.



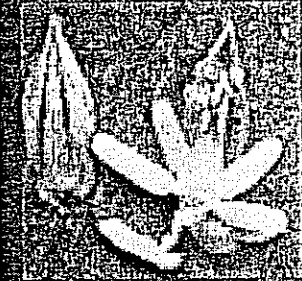
*Rendering of future Water Education Center*

## Water Education Center

With architectural and exhibit design firms selected, the Southern California Water Education Center moved closer to its 2004 opening. The Center will chronicle the development of water in Southern California and offer hands-on learning experiences for visitors of all ages. It will spotlight the importance of water as a shared public resource and the need to manage it fairly. The Water Education Center will be located in a new museum complex situated at the entrance to Diamond Valley Lake in Riverside County.



*Protector del Agua instructors offer water-wise landscape instruction*



*Mexican Rush  
(Juncus mexicanus)  
© 2002 Larry Blakely*

# Water Recycling

## Numbers

**1982 - Start of Metropolitan's Local Projects Program**

**75,000 - The number of acre-feet produced with recycled water in fiscal year 2002 by Metropolitan-funded member agency projects**

**\$15 million - Metropolitan's fiscal year 2002 commitment to recycled water projects**

**\$95 million - Metropolitan's 20-year investment in recycled water projects**

**53/37 - 53 is the number of funding agreements Metropolitan has with member agencies; 37 are currently operational**

**Three - Number of new Southland recycling projects built and nearing operation**

## A Valuable Source of Supply

By the 1920s, local water agencies realized the value of recycled water as a source of supply. This vision most recently led to the development of approximately 201,000 acre-feet of recycled water in fiscal year 2002.

For more than 20 years, Metropolitan has invested in Southland water recycling projects, committing about \$95 million to date. Metropolitan's newest program was established in 1998 and includes a twist—a competitive element. The Local Resources Program calls for member agencies to submit project proposals for evaluation. This program structure fosters competitiveness and encourages the development of cost-effective recycled water and groundwater recovery projects.

Metropolitan currently has funding agreements for 53 member agency recycling projects—37 of which were in operation in fiscal year 2002. Together, these projects produced about 75,000 acre-feet of water, with Metropolitan contributing \$15 million toward production in fiscal year 2002. Local agencies produced an additional 126,000 acre-feet of recycled water without financial assistance from Metropolitan.

There are many more opportunities for recycled water projects under evaluation. A long-term study spearheaded by the U.S. Bureau of Reclamation nearly a decade ago points to the potential for 34 short-term projects with an estimated yield of more than 450,000 acre-feet per year (AFY).

By the 1920's, local water agencies realized the value of recycled water as a source of supply. This vision most recently led to the development of approximately 201,000 acre-feet of recycled water in fiscal year 2002.



# Water Recycling

## New Recycling Projects

The following projects have been built and are expected to begin operation in 2003:

### *Escondido Regional Reclaimed Water Project (2,800 AFY)*

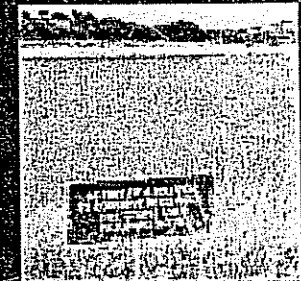
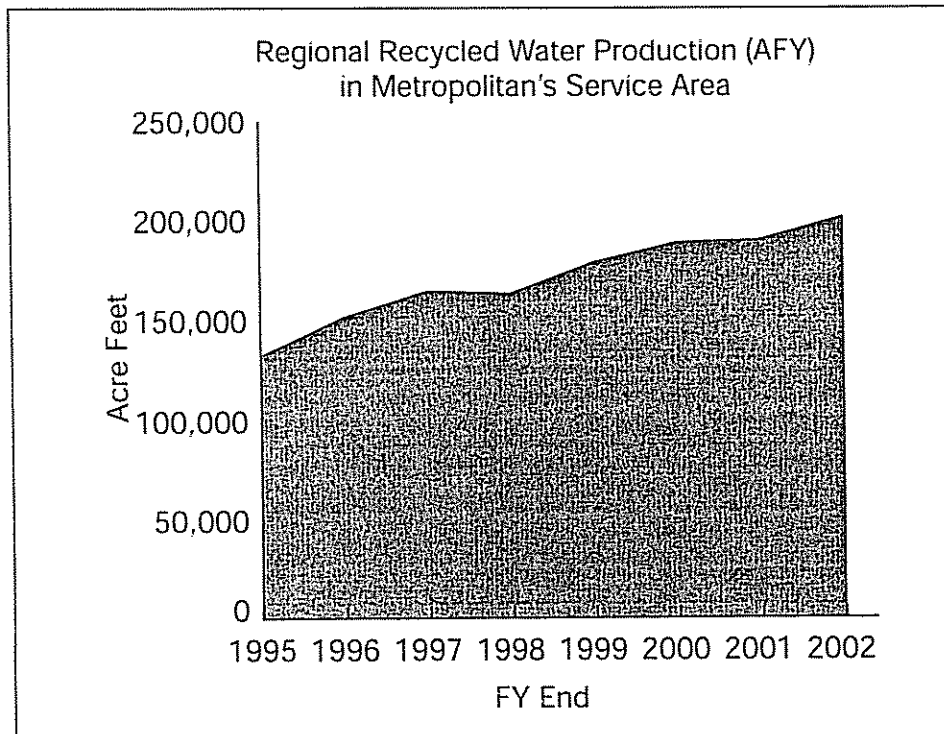
An agreement with the San Diego County Water Authority and city of Escondido. The project will irrigate parks, golf courses, and freeway medians within the city of Escondido.

### *Rincon del Diablo Recycled Water Program (648 AFY)*

An agreement with the San Diego County Water Authority and Rincon del Diablo Municipal Water District. The project will provide landscape water for a number of uses including parks, golf courses, and schoolyards within the city of Escondido.

### *Harbor Water Recycling Project (5,000 AFY)*

An agreement with the city of Los Angeles. The project will provide recycled water for a seawater intrusion barrier and for industrial uses.



*Recycled water use for  
landscape irrigation*



*Western Columbine  
(Aquilegia formosa)  
© 2001 Jeff Abbas*

# Groundwater Recovery

## Numbers

**11** - Number of years Metropolitan has been funding groundwater recovery projects

**\$6 million** - Metropolitan's fiscal year 2002 contribution

**\$26 million** - Metropolitan's total investment to date

**22/15** - 22 is the number of agreements between Metropolitan and member agencies to fund recovery projects; 15 is the number of projects in operation

**32,000** - Number of acre-feet recovered through groundwater treatment both by Metropolitan-funded projects and member agency projects

## Groundwater Reservoirs

Natural groundwater reservoirs in Southern California serve an important function as storage conservation facilities for local and imported water. When groundwater in storage becomes contaminated, water agencies have to rely more heavily on imported surface water supplies or try to recover the water through treatment. Treatment for polluted groundwater is quite costly and poses some environmental challenges.

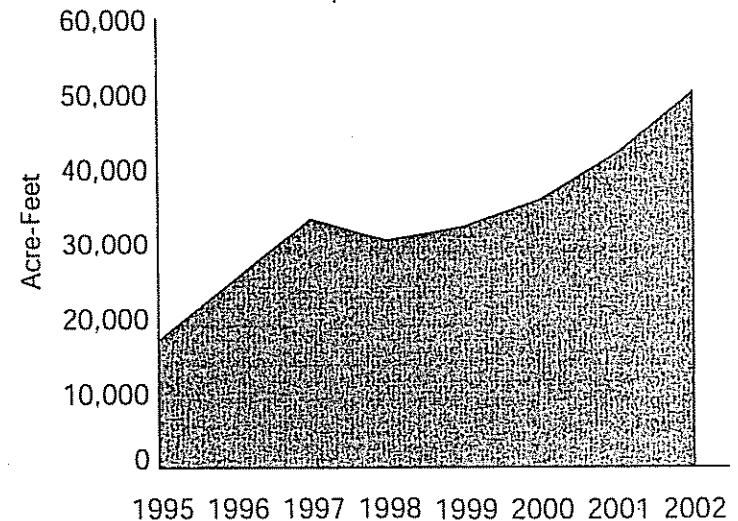
Over the past 11 years, Metropolitan has invested about \$26 million to help fund member agency groundwater recovery projects. Funding agreements exist for 22 projects, 15 of which are in operation and credited with recovering about 32,000 acre-feet of water in fiscal year 2002. Metropolitan's fiscal year contribution was \$6 million. In addition, local water agencies produced another 18,000 acre-feet of recovered groundwater without financial assistance from Metropolitan, bringing the regional total to 50,000 acre-feet for the year.

## Project Start-ups

### *San Juan Basin Desalter Project (4,800 AFY)*

This project, located in the city of San Juan Capistrano, began construction in late 2002 and is expected to be operational in 2004-05. The project will pump and treat brackish groundwater from the Lower San Juan Basin in South Orange County. It is made possible under a 20-year Groundwater Recovery Program agreement with Metropolitan, Municipal Water District of Orange County and San Juan Basin Authority.

Regional Recovered Groundwater Production (AFY)  
in Metropolitan's Service Area



# Groundwater Conjunctive Use

## Conjunctive Use Plays a Significant Role in California Water Management

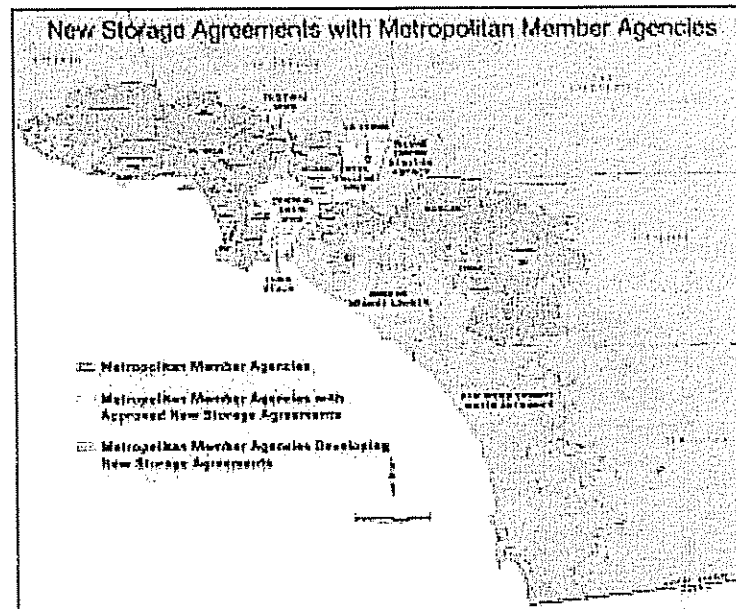
“Conjunctive use” refers to the coordinated operation of groundwater and surface water programs to increase supply yield. For Metropolitan, it involves storing imported water in groundwater basins for use during times of shortage or drought. Groundwater basins in Metropolitan’s service area yield an annual average of 1.3 million acre-feet. The water withdrawn from these underground reservoirs is replenished both naturally and through man-made means.

Since the 1950s, Metropolitan has utilized conjunctive use with local agencies to enhance their management of local supplies. Metropolitan supports a wide variety of conjunctive use programs offering options that range from pricing incentives (lower costs) for replenishment supplies to contractual programs for dry years or emergencies. Conjunctive use programs are an integral part of Metropolitan’s central planning document called the “Integrated Resources Plan,” or IRP.

Conjunctive use program development received a financial boost with funds from Proposition 13 (The Safe Drinking, Clean Water, Watershed Protection and Flood Protection Act approved by voters in 2000), which awarded \$45 million to Metropolitan to help finance conjunctive use programs in Metropolitan’s service area.

## New Storage Agreements

In 2002, Metropolitan approved agreements with Three Valleys Municipal Water District and the city of La Verne, as well as Central Basin Municipal Water District and the city of Long Beach. These two agreements will provide a total of 16,000 acre-feet of storage. In addition, Metropolitan is finalizing agreements with the San Diego County Water Authority, Foothill Municipal Water District, Inland Empire Utilities Agency, and the Municipal Water District of Orange County to develop five more conjunctive use programs within Metropolitan’s service area. These programs will develop approximately 192,000 acre-feet of storage for Southern California.



## Numbers

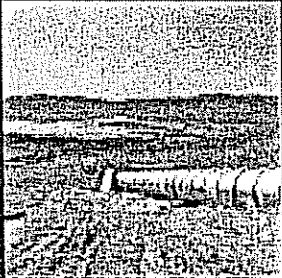
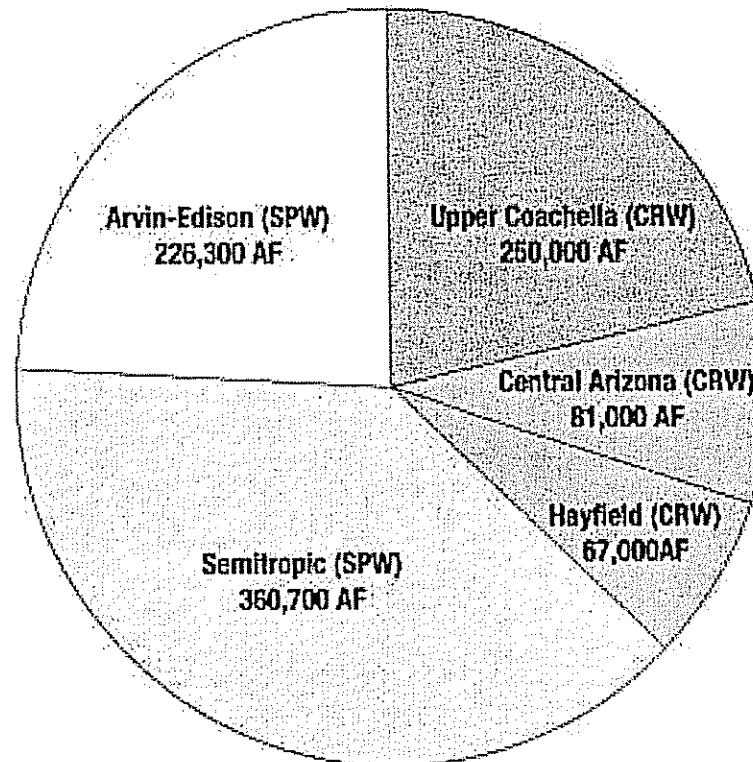
- 1950 - Start of Metropolitan's involvement with conjunctive use
- 1.3 million - Annual average acre-foot yield of Southland groundwater basins
- \$45 million - Amount received by Metropolitan from Proposition 13 bond measure for pursuing conjunctive use and other water projects
- 16,000 - Number of acre-foot storage expected with two new conjunctive use agreements in 2002
- 192,000 - Potential new acre-foot storage available with five new agreements in the final stages of negotiation

# Metropolitan Water Storage

## Metropolitan Water Stored in Groundwater Basins Outside its Service Area

(as of December 2002)

Total Colorado River Water (CRW) Groundwater Storage:	398,000 AF
Total State Project Water (SPW) Groundwater Storage:	587,000 AF
Total MWD Groundwater Storage Outside its Service Area:	985,000 AF



*The Hayfield Groundwater  
Storage Program in east  
Riverside County*



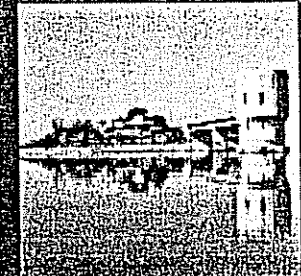
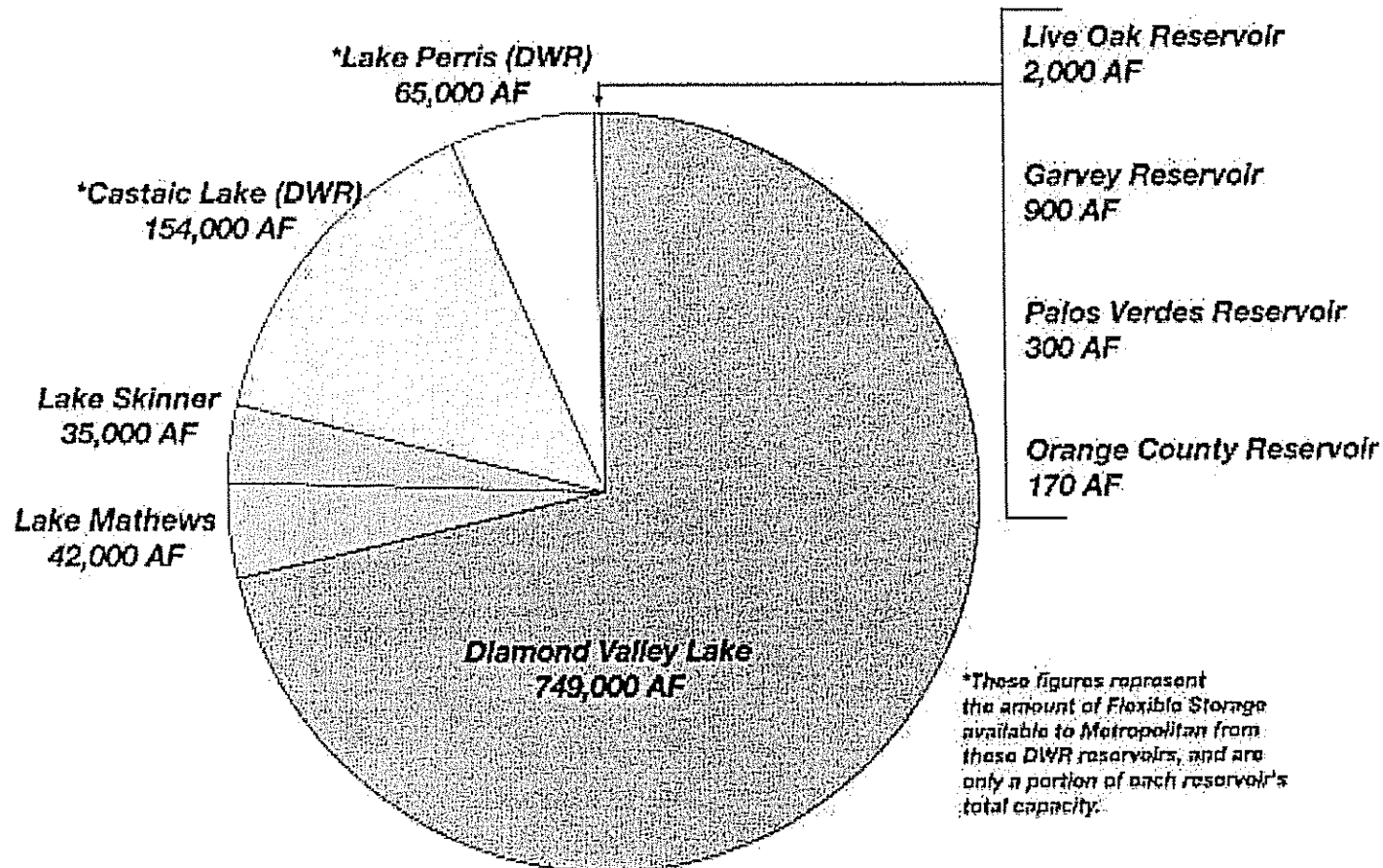
*Seaside Heliotrope  
(Heliotropium curassavicum)  
© 2001 Jeff Abbas*



# Metropolitan Water Storage

## Metropolitan Surface Water Stored in Metropolitan & DWR Reservoirs in Southern California

Total Storage: 1,048,300 AF  
(as of December 2002)



Lake Skinner Reservoir



Blue Dicks  
(*Dichelostemma capitatum* sp.  
*pauciflorum*)  
© 1998 Larry Blakely

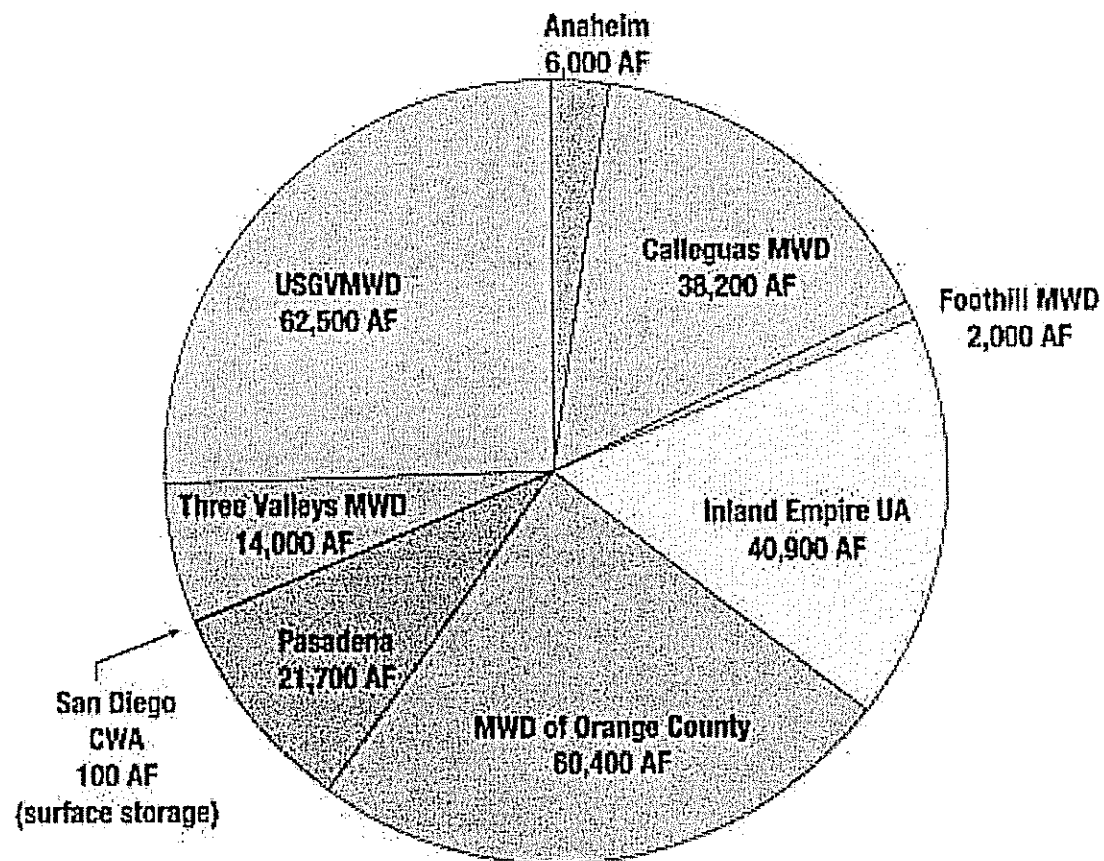
# Metropolitan Water Storage

## Metropolitan Water Stored In Southern California Groundwater Basins and Local Agency Reservoirs

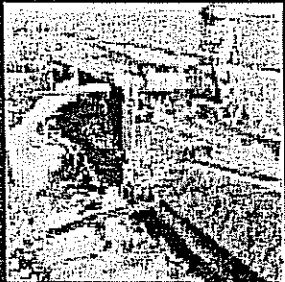
*Based on All of Metropolitan's Groundwater Programs*

**Total Storage: 245,800 AF**

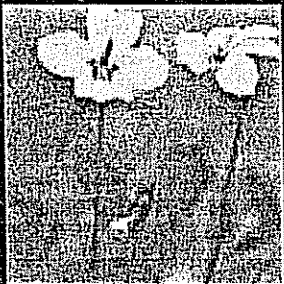
*(as of December 2002)*



### Achievements



*Groundwater pump in the  
Arvin-Edison service area in  
Kern County*



*California Golden Violets  
(Viola pedunculata)  
© 2002 Robert Potts,  
California Academy of Sciences*

# Seawater Desalination

## Seawater Desalination Program

In August 2001, Metropolitan initiated the Seawater Desalination Program to support the development of cost-effective seawater desalination projects that will contribute to greater water supply reliability. In November 2001, Metropolitan issued a competitive Request for Proposals (RFP) soliciting seawater desalination project proposals sponsored by member agencies. The RFP targets projects that would contribute up to 50,000 acre-feet per year and be eligible for financial incentives of up to \$250 per acre-foot of production.

Metropolitan received five proposals that collectively could produce about 126,000 acre-feet of drinking water per year. Detailed proposals were received from the Los Angeles Department of Water and Power, Long Beach Water Department, Municipal Water District of Orange County, San Diego County Water Authority and West Basin Municipal Water District. All of the proposals were evaluated by an RFP review committee comprised of Metropolitan staff and outside water resource specialists, who were guided in their selection by criteria adopted by Metropolitan's board.

Metropolitan is working with member agencies to develop a coordinated, cooperative agenda for seawater desalination research.

Metropolitan's board is considering the inclusion of an additional 100,000 acre-feet per year of desalted seawater as part of the current Integrated Resources Plan Update. This could increase the target number of desalinated acre-feet per year of water from 50,000 acre-feet per year to 150,000 acre-feet per year to offset increased demand or reduced local and imported supplies. Metropolitan and its member agencies are evaluating the costs and benefits of an expanded seawater desalination target.

## Numbers

*2001 - Year Metropolitan issued a Request for Proposal for seawater desalination projects*

*Five - Number of desalination project proposals submitted*

*126,000 - Number of acre-feet that new desalination projects proposed by member agencies could produce*

*\$250 - Maximum financial incentive offered by Metropolitan per acre-foot of seawater desalination production*

*150,000 - Number of acre-feet of desalted seawater considered for Metropolitan's new planning target*

# System Reliability

Metropolitan continues to implement a comprehensive supply plan that consists of a diverse set of resources to meet long-term future supply demands. Metropolitan's current practices allow the district to bring water supplies online at least ten years in advance of demand with a very high degree of reliability.

## Diamond Valley Lake

One cornerstone to Metropolitan's supply plan is the district's own Diamond Valley Lake. Southern California's largest water storage reservoir provides critical water storage south of the San Francisco-San Joaquin Bay-Delta and almost doubles Southern California's surface storage. Diamond Valley Lake also provides Southern California with security in case of a major earthquake because it holds six months of emergency supply.

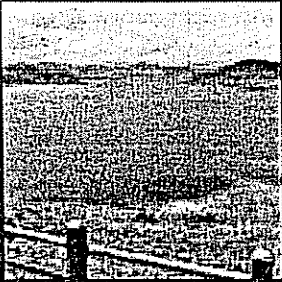
Diamond Valley Lake, which has the capacity to hold about 800,000 acre feet – or 260 billion gallons – of water, is nearly full and is counted among the various sources of surface and underground storage that can be delivered to Southern California to meet demands. Including Diamond Valley Lake, we have a total of about 2 million acre-feet of water stored in:

- Castaic Lake
- Perris Lake
- Multi-year banking and transfer programs in the California Central Valley
- MWD reserves in the San Luis Reservoir
- Groundwater conjunctive-use programs
- North Las Posas Storage Program

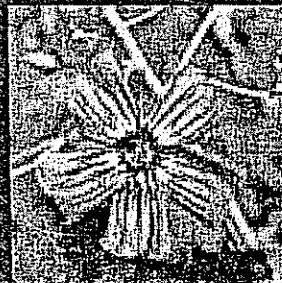
In addition, Metropolitan continues to pursue other storage-related programs, including its own Hayfield groundwater storage program near the Colorado River Aqueduct, transfer options from the Sacramento Valley and other storage programs funded by Proposition 13.

The availability of Diamond Valley Lake also has allowed Metropolitan needed flexibility for operations as well as infrastructure maintenance and repair – particularly with a major overhaul of the Colorado River Aqueduct during fiscal year 2002-2003 and improvements to Lake Mathews (see next page). Other benefits include:

- Water quality benefits that allow MWD to blend water from the State Water Project and Colorado River supplies
- Ability to take water from the Bay-Delta when supplies are available and environmental effects to endangered species are minimal
- Ability to release surplus water supplies through MWD's distribution system to member agencies to improve the region's groundwater recharge program



*Diamond Valley Lake*



*Malva Rosa*  
(*Lavatera assurgentiflora*)  
© 1995 Br. Alfred Brousseau,  
Saint Mary's College



# System Reliability

## Improving Infrastructure Reliability

For more than six decades, Metropolitan has relied on the Colorado River Aqueduct. As the region's population has increased, so have the challenges of ensuring supply reliability. In response to those challenges, Metropolitan has launched several initiatives to ensure infrastructure reliability.

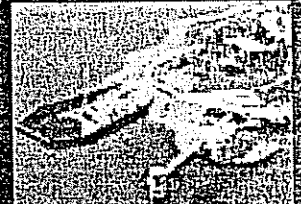
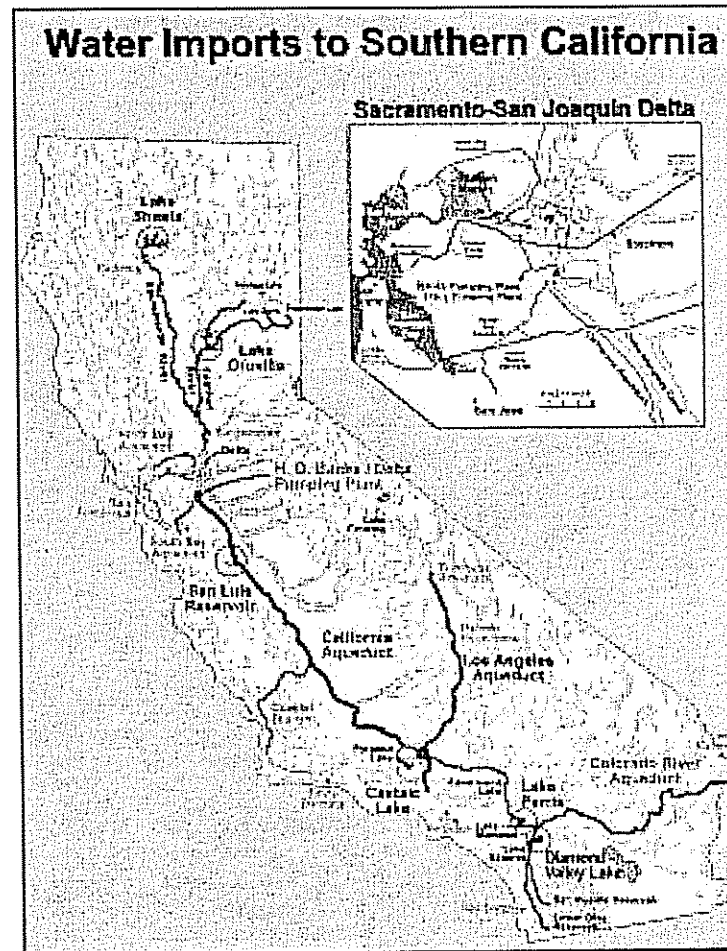
### Lake Mathews

Metropolitan's oldest reservoir is receiving a \$92 million renovation that includes construction of a new outlet tower to draw water out of the lake and into Metropolitan's distribution system. Also, the existing tower is being modified with both projects expected to be operational by 2004. Before the construction of Diamond Valley Lake, Lake Mathews was Metropolitan's largest reservoir.

### San Diego Pipeline No. 6

In October 2002, Metropolitan's board authorized \$6.5 million for design work and the start of land acquisition for a portion of a major supply pipeline that will deliver water to Temecula in southwestern Riverside County, and eventually extend to the San Diego County Water Authority service area.

The initial phase of San Diego Pipeline No. 6 is a \$100 million project that will deliver water from the Colorado River and the State Water Project to the Eastern Municipal Water District and the Western Municipal Water District of Riverside County. The first section of the pipeline is expected to be complete in 2006. The overall project cost is \$426 million.



*Lake Mathews new inlet/outlet tower construction*



*Sand Spurrey  
(Spergularia atropurpurea)  
© 2002 Dean Wm. Taylor*